

# PATENT SPECIFICATION

294,300

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## PROVISIONAL SPECIFICATION.

### Improvements in or relating to Frame Aerials for use in Radio Receiving Apparatus.

I, PERCY PERRING-THOMS, a British subject, of 67, Upper North Street, Brighton, in the County of Sussex, do hereby declare the nature of this invention to be as follows:—

This invention relates to, and has for its object the provision of improvements in frame aerials for use in radio apparatus.

The invention comprises the arrangement according to which two frame aerials are adapted to be alternatively employed with one receiving set for long and short wave length bands respectively, the arrangement being such that when one of said aerials is in use the other is connected thereto in such a way as to act as a boosting antenna.

The invention further comprises the arrangement, in a portable receiving set, of a frame aerial with a boosting antenna connected thereto.

In accordance with one embodiment of the invention a portable receiving set is provided with two tapped frame aerials one for long and the other for short wave length reception. Each aerial when in use is adapted to be connected to the set in the well known manner with one end connected to the reaction condenser, the other end to the grid of the first valve and the tapped point to the filament of said first valve. When the long wave length frame is in use the other frame is entirely disconnected from the set but when the short wave length frame is in use the long wave length frame is connected, at one end only to the electrical centre of the portion of said short wave length frame which is across the grid and filament. In this way said long wave length frame acts as a boosting antenna for increasing the range of receptivity, the short wave length frame owing to its small number

of turns having a comparatively short range of receptivity when not thus assisted.

The connections are adapted to be established alternatively by means of one four pole two way switch, that is to say a switch comprising three sets of four contacts each, the contacts of the centre set being adapted to be connected respectively to corresponding contacts of either of the outside sets.

Thus designating the contacts of each set by the numerals 1, 2, 3, 4 (the same numeral representing corresponding contacts of the three sets) the two ends and the tapping point of the long wave length frame are connected respectively to the contacts 1, 3 and 2 of one outside set and the two ends and tapping point of the short wave length frame are connected respectively to the contacts 1, 3 and 2 of the other outside set. The contact 3 of the former outside set is permanently connected to the contact 4 of the latter outside set. The contacts 1, 2 and 3 of the centre set are connected respectively to the grid, filament and reaction condenser and the contact 4 of said centre set is connected to the electrical centre of the aforesaid part of the short wave length frame.

I have found that the following are suitable turn numbers for the principal English and Continental stations on an eleven inch frame:—

Long wave length frame 60 turns, tapped point 50 turns from the grid end.

Short wave length frame 27 turns, tapped point 15 turns for the grid end.

Dated this 3rd day of May, 1927.

A. A. THORNTON,  
Chartered Patent Agent,  
Quality Court, Chancery Lane, London,  
W.C. 2.

For the Applicant.

## COMPLETE SPECIFICATION.

### Improvements in or relating to Frame Aerials for use in Radio Receiving Apparatus.

I, PERCY PERRING-THOMS, a British subject, of 12, Hampton Street, Brighton, [Price 1/-]

in the County of Sussex, formerly of 67, Upper North Street, Brighton, aforesaid.

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do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to, and has for its object the provision of improvements in frame aerials for use in radio apparatus.

The invention comprises the arrangement according to which two frame aerials are adapted to be alternatively employed with one receiving set for long and short wave length bands respectively, the arrangement being such that when one of said aerials is in use the other is connected thereto in such a way as to extend the effective area thereof as a collector of signal energy.

In order that the invention may be the more clearly understood a portable receiving set in accordance therewith will now be described reference being made to the accompanying drawings, wherein:—

Fig. 1 diagrammatically illustrates said receiver up to the first valve.

Figs. 2 and 3 are diagrams of connection, shown drawn out for the sake of clearness, of the elements of Fig. 1 in their two positions of receptivity.

Thus said portable receiving set is provided with two tapped frame aerials 1 and 2, the former being for long, and the latter for short, wave length reception.

Each aerial when in use is adapted to be connected to the set in the well known manner with one end connected to the reaction control condenser 3, the other end to the grid of the first valve 4 and the tapped point to the filament of said first valve 4. When the long wave length frame 1 is in use the other frame is entirely disconnected from the set and the arrangement is as shown in Fig. 2.

When the short wave length frame 2 is in use the long wave length frame 1 is connected, at one end only to the electrical centre of the portion of said short wave length frame which is across the grid and filament. The arrangement is then as shown in Fig. 3. In this way said long wave length frame 1 acts so as to extend the effective area of the short wave length frame 2 thereby increasing the range of receptivity, said short wave length frame 2 owing to its small number of turns having a comparatively short range of receptivity when not thus assisted.

The connections are adapted to be established alternatively by means of one four pole two way switch, that is to say a switch comprising three sets of four contacts each, viz. a centre set comprising contacts 1a, 2a, 3a and 4a an outside

set comprising contacts 1b, 2b, 3b and 4b and an outside set comprising contacts 1c, 2c, 3c and 4c. The contacts of the centre set are adapted to be connected alternatively to the corresponding contacts of either of the outside sets.

The two ends and the tapping point of the long wave length frame 1 are connected respectively to the contacts 2b, 4b and 3b and the two ends and tapping point of the short wave length frame are connected respectively to the contacts 2c, 4c and 3c. The contact 2b is permanently connected to the contact 1c. The contacts 4a, 3a and 2a are connected respectively to the grid and filament of said first valve 4 and the reaction control condenser 3, and the contact 1a is connected to the electrical centre of the part of the short wave length frame between the contacts 3c and 4c. It will be readily seen that when contacts 1a, 2a, 3a and 4a are connected each to each to contacts 1b, 2b, 3b and 4b the connections are as shown in Fig. 2. When said contacts 1a to 4a are connected each to each to the contacts 1c to 4c the connections are as shown in Fig. 3.

I have found that the following are suitable turn numbers for the principal English and Continental stations on an eleven inch frame:—

Long wave length frame 60 turns, tapped point 50 turns from the grid end.

Short wave length frame 27 turns, tapped point 15 turns for the grid end.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. The combination of two frame aerials adapted to be alternatively employed with one receiving set for long and short wave length bands respectively, the arrangement being such that when one of said aerials is in use the other is connected thereto in such a way as to extend the effective area thereof as a collector of signal energy.

2. The combination according to Claim 1, wherein said former aerial is the short wave length aerial and the latter the long wave length aerial.

3. The combination according to Claim 2, wherein when the long wave length aerial is in use the short wave length aerial is entirely disconnected from circuit.

4. The combination according to Claim 3 and comprising a switch having two positions at one of which said long wave length aerial is in use and said short wave length aerial entirely disconnected from circuit and at the other of which said

short wave length aerial is in use and said long wave length aerial is connected to said short wave length aerial in such a way as to act as a boosting antenna.

- 5 5. The combination according to Claim 3, wherein both said aerials are tapped, aerials and when in use have one end connected to the grid of the first valve the other end connected to a reaction condenser and the tapped point connected to the filament of said first valve, and  
10 wherein when the short wave aerial is in use said long wave aerial is connected at one end to the electrical centre between  
15 the tapped point and one end of said short

wave aerial.

6. The combination according to Claim 3 wherein said switch is a four pole two way switch connected in circuit substantially as described.

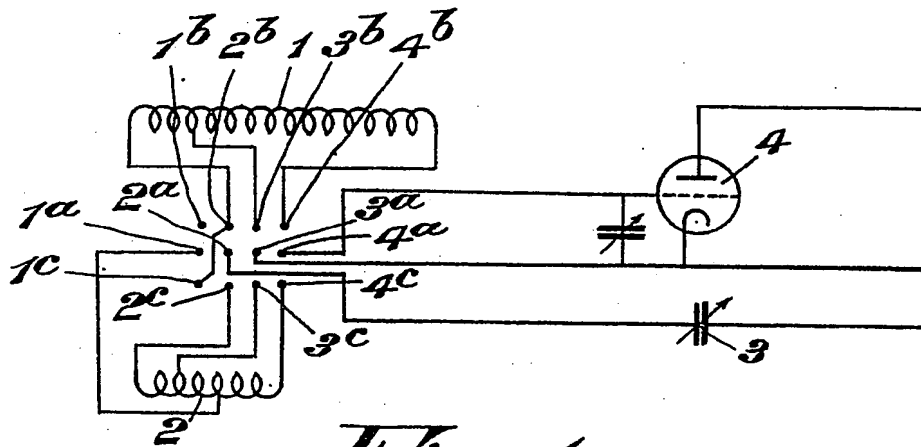
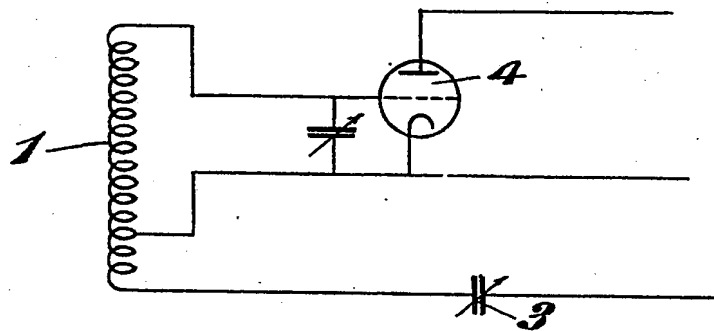
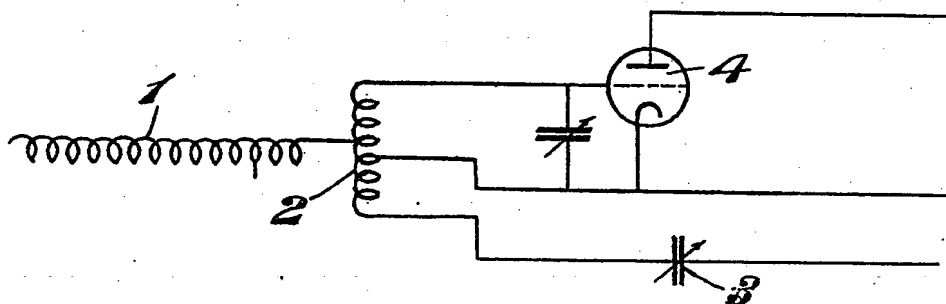
7. The combination of two frame aerials substantially as herein specified with reference to the accompanying drawings.

Dated this 3rd day of February, 1928.

A. A. THORNTON,  
Chartered Patent Agent,  
Quality Court, Chancery Lane, London,  
W.C. 2.  
For the Applicant.

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*Fig. 1.**Fig. 2.**Fig. 3.*

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